

APPENDIX A

OPERABILITY REQUIREMENTS

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11 - WET PIPE SPRINKLER SYSTEM

1.0 COMMITMENT

The wet pipe sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. There is an adequate quantity of water and pressure available from the plant water system to supply the system at its required minimum design conditions.
- C. All piping, fittings, hangers, sprinklers, and other components are in required locations and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with water.
- B. The control valve is open.
- C. The waterflow alarm is operable.
- D. Sprinkler operating fusible links are operable and located in all required locations.
- E. Fire sprinkler heads are not obstructed.
- F. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign at the fire department connection (FDC) and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the inspector's test connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic test any repaired parts of the system before returning to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25

8.0 BASIS

The operability of the wet pipe fire sprinkler system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters. It also ensures that the life safety provisions of the facility are maintained during all anticipated operations.

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12 - DRY PIPE SPRINKLER SYSTEM

1.0 COMMITMENT

The dry pipe sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. There is an adequate quantity of water and pressure available from the water system to supply the system at its required minimum design conditions.
- C. There is an adequate source of air to maintain the minimum required quantity of air pressure to keep the dry pipe valve from tripping when small piping leaks occur. (Less than the cross-sectional area of one sprinkler head orifice opening).
- D. All piping, fittings, hangers, sprinklers, and other components are in required locations and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with pressurized air or nitrogen at the required minimum pressure.
- B. Control valves are open.
- C. The waterflow alarm is operable.
- D. The sprinkler head operating fusible links are in operable condition and located in all required locations.
- E. Fire sprinkler heads are not obstructed.
- F. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed

schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25

8.0 BASIS

The operability of the dry pipe fire sprinkler system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters. It also ensures that the life safety provisions of the facility are maintained during all anticipated operations.

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13 - DELUGE SPRINKLER SYSTEM

1.0 COMMITMENT

The deluge sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. There is an adequate quantity of water and pressure available from the water system to supply the system at its required minimum design conditions.
- C. The deluge system fire detection subsystem is in service and connected to the deluge valve activation device.
- D. All piping, fittings, hangers, sprinklers, and other components are in required locations and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system control valve is open.
- B. The waterflow alarm is operable.
- C. Sprinkler heads are in operable condition and located in all required locations.
- D. Sprinkler heads are not obstructed.
- E. The fire detection subsystem is connected to the deluge valve activation device.
- F. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, NFPA 25, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

8.0 BASIS

The operability of the deluge fire sprinkler system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters. It also ensures that the life safety provisions of the facility are maintained during all anticipated operations.

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14 - PRE-ACTION SPRINKLER SYSTEM

(WITH SUPERVISORY AIR PRESSURE)

1.0 COMMITMENT

The pre-action sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. There is an adequate quantity of water and pressure available from the water system to supply the system at its required minimum design conditions.
- C. The pre-action system fire detection subsystem is in service and connected to the deluge valve activation device.
- D. The piping is pressurized by a maximum of 1.5 psi air or nitrogen pressure (systems over 20 heads).
- E. All piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with pressurized air or nitrogen.
- B. Control valves are open.
- C. The waterflow alarm is operable.
- D. Sprinkler heads are in operable condition and located in all required locations.
- E. Fire sprinkler heads are not obstructed.
- F. The fire detection subsystem is connected to the deluge valve activation device.
- G. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, NFPA 25, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

8.0 BASIS

The operability of the supervised pre-action fire sprinkler system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters. It also ensures that the life safety provisions of the facility are maintained during all anticipated operations.

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15 - PRE-ACTION SPRINKLER SYSTEM

1.0 COMMITMENT

The pre-action sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. There is an adequate quantity of water and pressure available from the water system to supply the system at its required minimum design conditions.
- C. The pre-action system fire detection subsystem is in service and connected to the deluge valve activation device.
- D. All piping, fittings, hangers, sprinklers, and other components are in required locations and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with air.
- B. Control valves are open.
- C. The waterflow alarm is operable.
- D. Sprinkler heads are in operable condition and located in all required locations.
- E. Fire sprinkler heads are not obstructed.
- F. The fire detection subsystem is connected to the deluge valve actuation device.
- G. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, NFPA 25, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed

schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

8.0 BASIS

The operability of the pre-action fire sprinkler system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters. It also ensures that the life safety provisions of the facility are maintained during all anticipated operations.

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16 - FOAM-WATER EXTINGUISHING SYSTEM

1.0 COMMITMENT

The foam-water extinguishing system is operable when the following are established:

- A. The system control valve(s) is in the open position.
- B. The system is connected to a water supply with an adequate quantity of water and pressure available to supply the system at its required minimum design conditions.
- C. The system is connected to a foam concentrate supply with an adequate quantity of concentrate to satisfy the system at its required minimum design conditions.
- D. The system is piped to an appropriate proportioner(s) to satisfy the system's foam and water concentration design criteria. The proportioner valves are in the normal operating positions.
- E. The system's discharge appliances (open or closed sprinkler heads, monitor nozzles, discharge lines, mixing chambers) are in the required positions and in good repair.
- F. The system fire detection subsystem is in service and connected to the deluge valve activation device.
- G. All piping, fittings, and hangers are in required locations and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The foam-water extinguishing system is operable with control valves in the open position.
- B. The system piping is filled with air or priming water.
- C. The foam concentrate tank is filled with the appropriate amount of concentrate.
- D. Proportioner valves are in their operational positions.
- E. The waterflow alarm is operable.
- F. Supervisory signals are operable.

- G. Discharge devices are operable, in the required locations, aligned properly, and unobstructed.
- H. Fire detection subsystem is in service and connected to the deluge valve activation device.
- I. Adequate water pressure and volume is available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 11, NFPA 13, NFPA 16, NFPA 25, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.

- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Consult the AHJ to determine whether or not a full flow test should be conducted on the repaired system.
- E. Hydrostatic and flush test any repaired parts of the system before returning to service.
- F. Test the fire detection subsystem to verify that all of the fire detectors are in place and will operate the deluge valve.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 11
- D. NFPA 13
- E. NFPA 16
- F. NFPA 25
- G. NFPA 72
- H. NFPA 72E

8.0 BASIS

The operability of the foam-water extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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21 - WET STANDPIPE SYSTEM

1.0 COMMITMENT

The wet standpipe sprinkler system is operable when the following are established:

- A. The system control valve is in the open position.
- B. Hose valves are operable and in the closed position, or hose outlets are capped.
- C. There is an adequate quantity of water and pressure available from the water system to supply the system with its minimum design conditions.
- D. Piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with water.
- B. Control valves are open.
- C. Hose connection valves are operable and capped.
- D. There is adequate water pressure and volume available.
- E. The water flow alarm is operable.
- F. The system hose valves are in required locations and located in such a manner that hose can be connected.
- G. The system's piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 14, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Place a tag at the FDC and hose valves indicating what portions of the system are out of service.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Hydrostatic test any repaired portions of the system.
- C. Flush test any repaired piping before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 14
- D. NFPA 25

8.0 BASIS

The operability of the wet standpipe system ensures that adequate water is available for manual fire suppression to contain fires occurring in the protected facility in accordance with its design parameters.

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22 - DRY STANDPIPE SYSTEM

1.0 COMMITMENT

The dry standpipe system is operable when the following are established:

- A. FDC is operable.
- B. An adequate quantity of water and pressure are available from the fire department pumper(s) to supply the system with the required volume and pressure.
- C. Hose valves are operable and in the closed position, or hose connections are capped.
- D. All piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The FDC is available for connection to the source of water and in good repair with pumper hose valves closed and operable.
- B. There is adequate water volume and pressure available.
- C. The system hose valves are in required locations and located in such a manner that hose can be connected.
- D. The system's piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 14, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the FDC and hose valves indicating what portions of the system are out of service.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Hydrostatic test any repaired portions of the system.
- B. Flush test any repaired piping before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 14
- D. NFPA 25

8.0 BASIS

The operability of the dry standpipe system ensures that adequate water is available for manual fire suppression to contain fires occurring in the protected facility in accordance with its design parameters.

1.0 COMMITMENT

The manual water spray system is operable when the following are established:

- A. The system control valve is in the closed position.
- B. There is an adequate quantity of water and pressure available from the water system to supply the system at its require minimum design conditions.
- C. Nozzles with an appropriate pattern, velocity, water particle size, and density are used with an appropriate alignment to satisfy the design requirements.
- D. In prepriming systems, blow-off plugs are installed properly on all nozzles.
- E. All piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The control valve is closed.
- B. The waterflow alarm is operable.
- C. Nozzles are in operable condition, unobstructed in all required locations, and aligned properly.
- D. There is adequate water pressure and volume available.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 15, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Stop all hazardous operations, or
- B. Start a recorded fire watch within 1 hour of the outage, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 8 hours or A or B or C shall be required until the repairs are complete.
- E. Post an impairment tag at the control valve when a system is out of service.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Hydrostatic and flush test any repaired parts of the system before returning to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 15
- D. NFPA 25

8.0 BASIS

The operability of the water spray system ensures that adequate fire suppression capability is available to contain fires occurring in the protected facility in accordance with its design parameters.

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31 - HALON 1301 (TOTAL FLOODING)

1.0 COMMITMENT

The Halon 1301 fire extinguishing system is operable when the following are established.

- A. There is an adequate quantity of containers filled with Halon 1301 fire extinguishing agent.
- B. There are Halon 1301 discharge nozzles in place, aligned properly, and unobstructed, to distribute the Halon at its minimum design conditions.
- C. Container activation devices are in place and in good repair.
- D. System piping, fittings, and hangers are in good repair.
- E. The fire detection subsystem is in service and connected to the container actuation devices.
- F. All openings to the volume being protected are closed or are connected for remote releasing automatically on system operation.
- G. All equipment interlocks are in operating condition.
- H. Container brackets are in good repair.
- I. Reserve Halon storage containers, where required, are connected to the system or stored in their designated location.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. Halon 1301 containers are in good physical condition, filled with the required quantity of Halon 1301 fire extinguishing agent, and mounted properly to meet the system's minimum design conditions.
- B. Discharge nozzles are in good physical condition, unobstructed, and aligned properly.
- C. The system's fire detection subsystem is in service and connected to the container actuation device(s).
- D. All openings that are closed or automatic-releasing devices are functioning properly.

- E. All equipment interlocks are operational.
- F. System piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 12A, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Weigh Halon containers and check pressure before returning to service.
- B. Conduct an operating test of the system before returning it to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12A
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the Halon 1301 fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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32 - HALON 1211 (TOTAL FLOODING)

1.0 COMMITMENT

The Halon 1211 fire extinguishing system is operable when the following are established.

- A. There is an adequate quantity of containers filled with Halon 1211 fire extinguishing agent.
- B. There are Halon 1211 discharge nozzles in place, aligned properly, and unobstructed, to distribute the Halon at its minimum design conditions.
- C. Container activation devices are in place and in good repair.
- D. System piping, fittings, and hangers are in good repair.
- E. The fire detection subsystem is in service and connected to the container actuation devices.
- F. All openings to the volume being protected are closed or are connected for remote releasing automatically on system operation.
- G. All equipment interlocks are in operating condition.
- H. Container brackets are in good repair.
- I. Reserve storage containers, where required, are connected to the system or stored in their designated location.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The Halon 1211 containers are in good physical condition, charged with the required quantity of Halon 1211 fire extinguishing agent, and mounted properly to meet the system's minimum design conditions.
- B. Discharge nozzles are in good physical condition, unobstructed, and aligned properly.
- C. The system's fire detection subsystem is in service and connected to the cylinder actuation devices.

- D. All openings that are closed or automatic-releasing devices are functioning properly.
- E. All equipment interlocks are operational, and system piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 12B, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Weigh Halon containers and check pressure before returning to service.
- B. Conduct an operating test of the system before returning it to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12B
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the Halon 1211 fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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1.0 COMMITMENT

The dry chemical extinguishing system is operable when the following are established.

- A. There is an adequate quantity of containers filled with an appropriate dry chemical extinguishing agent.
- B. Dry chemical containers are pressurized adequately or an appropriate expellent gas cartridge is provided to discharge the dry chemical agent.
- C. Container activation devices are in place and in good repair.
- D. There are dry chemical discharge nozzles in place, aligned properly, and unobstructed, to distribute the dry chemical at its minimum design conditions.
- E. All piping, hoses, fittings, and hangers are in good repair.
- F. Fire detection subsystem and manual activation devices are in service and connected to the container activation devices.
- G. All openings to the hazard being protected are closed or are connected for remote automatic releasing on system operation.
- H. All equipment interlocks are in operating condition.
- I. Container brackets are in good repair.
- J. Reserve dry chemical containers, where required, are connected to the system or stored in their designated location.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The dry chemical and expellent gas containers are in good condition, mounted properly, and charged with the required quantity of dry chemical extinguishing agent or expellent gas to meet the system's minimum design conditions.
- B. Discharge nozzles are in good physical condition, unobstructed, and aligned properly.
- C. The system's fire detection subsystem is in service and connected to

the container activation devices.

- D. All openings to the volume being protected are closed or automatic-releasing devices are functioning properly.
- E. All equipment interlocks are operational.
- F. The system's piping, hoses, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 17, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. If the dry chemical agent is stored in a pressurized cylinder, check the pressure before returning to service.

- B. If the system has a separate expellent gas cartridge, check each cartridge for proper operation before returning to service:
 - 1. Nitrogen cartridges - check pressure
 - 2. CO₂ cartridges - weigh cylinder
- C. Conduct an operating test of the system before returning to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing .

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 17
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the dry chemical extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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1.0 COMMITMENT

The wet chemical system is operable when the following are established.

- A. There is an adequate quantity of containers filled with an appropriate wet chemical extinguishing agent.
- B. There is an adequately sized expellant gas cartridge provided to discharge the wet chemical agent.
- C. Wet chemical discharge controls are in place and in good repair.
- D. There are wet chemical discharge nozzles in place, with nozzle caps, aligned properly, and unobstructed, to distribute the wet chemical at its minimum design conditions.
- E. All piping, fittings, and hangers are in good repair.
- F. Fire detection subsystem and manual activation devices are in service and connected to the wet chemical discharge controls.
- G. Devices ensuring the shutdown of fuel or power to the protected appliances function properly upon system actuation.
- H. Container brackets are in good repair.
- I. Reserve wet chemical containers, where required, are connected to the system or stored in their designated locations.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The wet chemical containers and expellant gas cartridges are in good physical condition, mounted properly, and charged with the required quantity of wet chemical agent or expellant gas to meet the system's minimum design conditions.
- B. Discharge nozzles are in good physical condition, unobstructed, and aligned properly.
- C. The system's fire detection subsystem is in service and connected to the wet chemical discharge controls.

- D. All fuel or power to appliances being protected is shut off or automatic shutoff devices are functioning properly.
- E. The system's piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 17A, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct an operating test as mentioned previously before returning the system to service.
- B. Check the level of wet chemical and expellant gas containers as mentioned previously before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 17A
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the wet chemical fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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35 - HIGH EXPANSION FOAM SYSTEM

1.0 COMMITMENT

The high expansion foam system is operable when the following are established.

- A. There is sufficient water quantity and water pressure available to supply the foam generators at their minimum design conditions.
- B. There is an adequate quantity and quality of foam concentrate in the system to supply the foam generators at minimum design conditions.
- C. Foam generators are in place with all fans in operating condition.
- D. All control valves are in their operating conditions (normally open).
- E. Supply piping, fittings, and hangers are in good repair.
- F. Supply air and foam duct closers are open or connected for remote opening upon system operation.
- G. All openings to the volume being protected are closed or connected for remote releasing upon system operation.
- H. High level air vents are open or connected for remote opening upon system operation.
- I. The fire detection subsystem is in service and connected to the high expansion foam controller.
- J. Reserve foam concentrate supplies, where provided, are connected to the system.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The water and foam concentrate supplies are connected to the foam generators and are sufficient in quantity and quality to satisfy the system's minimum design conditions.
- B. Foam generators are operable.
- C. All control valves are in their operating positions.
- D. All duct closers are open.

- E. All openings to the volume being protected are closed.
- F. All high level air vents are open.
- G. The fire detection subsystem is in service and connected to the high expansion foam controllers.
- H. The foam delivery system (piping, fittings, ducts, hangers) is in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 11A, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means shall be provided to protect the hazardous operations.
- D. Begin repair operations or A and B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume is available at the system connection.
- B. The AHJ shall decide whether or not a discharge test should be conducted on the repaired system.
- C. Hydrostatic and flush test any repaired piping of the system before returning to service.
- D. Test the fire detection subsystem to verify that all of the fire detectors are in place and will activate the high expansion foam controls.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 11A
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the high expansion foam system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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36 - CARBON DIOXIDE EXTINGUISHING SYSTEM (HIGH PRESSURE)

1.0 COMMITMENT

The CO₂ extinguishing system is operable when the following are established.

- A. There are an adequate number of high pressure cylinder containers, with CO₂ fire extinguishing agent under pressure, connected to piping and nozzles.
- B. The quantity of CO₂ fire extinguishing agent is adequate to meet the system's minimum design conditions.
- C. There are CO₂ discharge nozzles in place, aligned properly, and unobstructed, to distribute the CO₂ at its minimum design conditions.
- D. Cylinder activation devices are in place and in good repair.
- E. System piping, fittings, and hangers are in good repair.
- F. Fire detection subsystem is in service and connected to the cylinder actuation devices.
- G. All openings to the volume being protected are closed or are connected for remote releasing automatically on system operation.
- H. All equipment interlocks are in operating condition.
- I. Cylinder brackets are in good repair.
- J. Reserve CO₂ storage cylinders, where required, are connected to the system or stored in their designated location.
- K. Low pressure level supervisory signals are in service.
- L. CO₂ hand hose reels are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The high pressure CO₂ containers are in good physical condition and contain the minimum required quantity of extinguishing agent.
- B. Discharge nozzles are not obstructed and are aligned properly.

- C. Discharge activation devices are in place.
- D. The system's fire detection subsystem is in service and connected to the actuation device.
- E. All openings that are closed or automatic releasing devices are functioning properly.
- F. All equipment interlocks are operable.
- G. The system's piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 12, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within one hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or A and B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Weigh CO₂ cylinders and check pressure before returning to service.
- B. Conduct an operating test of the system before returning it to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the CO₂ fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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37 - CARBON DIOXIDE EXTINGUISHING SYSTEM (LOW PRESSURE)

1.0 COMMITMENT

The CO₂ extinguishing system is operable when the following are established.

- A. There is a low-pressure storage container, with CO₂ fire extinguishing agent under pressure, connected to piping and nozzles.
- B. The quantity of CO₂ fire extinguishing agent is adequate to meet the system's minimum design conditions.
- C. There are CO₂ discharge nozzles in place, aligned properly, and unobstructed, to distribute the CO₂ at its minimum design conditions.
- D. Container activation devices are in place and in good repair.
- E. System piping, fittings, and hangers are in good repair.
- F. The fire detection subsystem is in service and connected to the cylinder actuation devices.
- G. All openings to the volume being protected are closed or are connected for remote releasing automatically on system operation.
- H. All equipment interlocks are in operating condition.
- I. Container brackets are in good repair.
- J. Reserve CO₂ storage containers, where required, are connected to the system or stored in their designated location.
- K. Low pressure level supervisory signals are in service.
- L. CO₂ hand hose reels are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The low pressure CO₂ container is in good physical condition and contains the minimum required quantity of extinguishing agent.
- B. Discharge nozzles are not obstructed and are aligned properly.
- C. Discharge activation devices are in place.

- D. The system's fire detection subsystem is in service and connected to the actuation device.
- E. All openings are closed or automatic releasing devices are functioning properly.
- F. All equipment interlocks are operable.
- G. The system's piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 12, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and provide an alternate means to protect the hazardous operations.
- D. Begin repair operations immediately or A and B or C shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct an operating test of the system before returning to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the CO₂ fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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38 - WATER SPRAY SYSTEM (LOCAL APPLICATION)

1.0 COMMITMENT

The local application water spray system is operable when the following are established.

- A. The system connected to an adequate water supply with the quantity and pressure available meet the system's minimum design conditions.
- B. The system is connected to a listed or approved control panel that is functioning properly.
- C. Approved water spray nozzles with operable fusible links are in all required locations and unobstructed.
- D. The waterflow alarm is in place and operable.
- E. Automatic shutdowns for fuel to the protected equipment are in service and connected to the control panel.
- F. The system control valve is open.
- G. Piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The local application water spray system is connected to an adequate water quantity and pressure.
- B. The system is connected to a functioning control panel.
- C. The system control valve is open.
- D. Approved water spray nozzles with fusible links are in all required locations and unobstructed.
- E. The waterflow alarm is operable and connected to the control panel for automatic fuel shutdown and system alarm.
- F. All piping, fittings, and hangers are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 13, NFPA 15, and NFPA 96.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag on the control valve indicating what portion of the system is out of service.
- B. Remove all protected equipment from service until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning it to service.

5.3 Testing

- A. Test the water supply to verify that an adequate water quantity and pressure is available at the system's connection.
- B. Conduct a test of the bypass valve to verify that the system local alarm and fuel shutdown devices are functioning properly.
- C. Hydrostatic and flush test any repaired portions of the system before returning it to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 15
- E. NFPA 96

8.0 BASES

The operability of the water spray fire extinguishing system ensures that adequate fire suppression capability is available to contain fires occurring in the protected area in accordance with its design parameters.

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1.0 COMMITMENT

Pond and river water supply are operable when the following are established.

- A. Control valves are in operating positions (normally open).
- B. An adequate quantity and quality of water is stored in the reservoir to meet the system's minimum design conditions.
- C. The wet pit, where provided, is structurally sound, free of debris, and maintained at a minimum temperature of 40 °F.
- D. Strainers and/or purification systems are in good working condition.
- E. Any suction openings are adequately submerged.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. An adequate quantity and quality of water is available in the reservoir at a pressure that meets the system's minimum design conditions.
- B. Suction strainers and purification systems are in good repair.
- C. Control valves are open.
- D. The suction orifice is adequately submerged.
- E. The fire pump is operable with adequate driver and power or fuel.
- F. The waterflow alarm is operable.
- G. The system piping, hydrants, FDCs, etc. are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) and NFPA 1231.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed

schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag on all control valves, FDCs, and hydrants dependent upon that particular system.
- B. Stop all hazardous operations, or
- C. If the system supplies an automatic suppression system, start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct a flow test per the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.
- B. Hydrostatic and flush test repaired portions of system piping before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection, testing, and maintenance.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 1231

8.0 BASIS

The operability of the water supply ensures that adequate water volume and pressure is available for the operation of hydrants, sprinkler systems, and standpipe systems. These are used for suppressing fires occurring in the protected area within their own design parameters.

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42 - TANK WATER SUPPLY SYSTEM

1.0 COMMITMENTS

Water storage tanks are operable when the following are established.

- A. Control valves are in operating positions (normally open).
- B. The tank is structurally sound.
- C. Where subject to freezing, the tank and tank riser are adequately heated and/or insulated.
- D. The water discharge system piping is operable and in good repair.
- E. Automatic tank floats for refill and fill shutoff are in place and operable.
- F. There is an adequate volume of water and pressure provided for the tank to satisfy its minimum design conditions.
- G. System piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The tank is filled with water.
- B. Control valves are open.
- C. Floats for refilling and refill shutoff are in place and operable.
- D. Discharge piping is in good repair and operable.
- E. There is an adequate volume and pressure to supply fire suppression systems at their minimum design conditions.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 22, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Stop all hazardous operations, or
- B. If the system supplies automatic suppression systems, start a recorded fire watch within 1 hour of the outage, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 8 hours or A or B or C shall be required until the repairs are complete.
- E. Place a tag at all FDCs, applicable hydrants, and control valves stating what portions of the system are out of service.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct a flow test per DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.
- B. Hydrostatic and flush test repaired portions of system piping before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection, testing, and maintenance.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 22
- D. NFPA 25

8.0 BASIS

The operability of the tank water supply system ensures that adequate water volume and pressure is available for the operation of hydrants, sprinkler systems, and standpipe systems. These are used for suppressing fires occurring in the protected area within their own design parameters.

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43 - FIRE PUMPS

1.0 COMMITMENT

The fire pump system is operable when the following are established.

- A. Control valves are in the appropriate position.
- B. Adequate suction and discharge pressures and volumes available to meet the system's minimum design conditions.
- C. There is an adequate primary power source and secondary power source, where required, to operate drivers and drive the pumps at their minimum design conditions.
- D. The pump is connected to an adequate quantity and quality of water to supply the distribution system at its minimum design conditions.
- E. The controller (manual or automatic) is operable to start and stop the pump as needed under an emergency condition.
- F. All piping, fittings, and hangers are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. There is an adequate quantity and quality of water available.
- B. Control valves are open.
- C. Strainers are in place and operable.
- D. The driver (electric, fuel, or steam) is operable and has adequate power.
- E. Appropriate suction and discharge pressures are available.
- F. The controller is operable and properly adjusted.
- G. There is sufficient piping to deliver an appropriate volume and pressure of water to suppression systems at their minimum design conditions.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 20, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a tag at each control valve indicating what system or part thereof has been removed from service.
- B. Stop all hazardous operations, or
- C. If automatic systems are supplied by the pump, start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means of water supply to protect the hazardous operations.
- E. Begin repair operations within 8 hours, and the AHJ shall determine if B, C, and D shall be required until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct and pass a performance test before returning to service to verify that an adequate volume and water pressure is available.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 20
- D. NFPA 25

8.0 BASIS

The operability of the pumping system ensures that an adequate volume and pressure of water is available for the various extinguishing systems. These are used to contain fires occurring in the protected facility in accordance with their own design parameters.

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44 - FIRE SERVICE MAINS

1.0 COMMITMENT

The fire service main is operable when the following are established.

- A. Fire main control valves are in the open position.
- B. Hydrants are operable and in appropriate positions.
- C. There is an adequate volume and pressure of water available from the water supply to meet design conditions.
- D. All piping and fittings are in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The system is filled with water.
- B. Control valves are in appropriate positions (normally open).
- C. Fire hydrants are operable, in appropriate locations, and unobstructed.
- D. There is adequate water pressure and volume available.
- E. The system's piping and fittings are in good repair.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 24, and NFPA 25.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a tag at each FDC and system control valve indicating what system or part thereof has been removed from service
- B. Stop all hazardous operations, or
- C. If the system supplies automatic sprinkler systems, start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours, and the AHJ shall decide if B, C, and D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available.
- B. Hydrostatically test the system per the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.
- C. Conduct a flow test per the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.
- D. Flush test any repaired system per the DOE Fire Protection Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 24
- D. NFPA 25

8.0 BASIS

The operability of the fire main service ensures that adequate water volume and pressure is available for the operation of hydrants, monitor nozzles, hose and hydrant houses, and sprinkler and standpipe risers. These are used for suppressing fires occurring in the protected facility within their own design parameters.

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51 - FIRE ALARM SYSTEM

1.0 COMMITMENT

The Fire Alarm System is operable when the following are established.

- A. Alternating current (AC) power is supplied to the system.
- B. Direct current (DC) power is supplied to the system.
- C. All alarm initiation devices are installed and operational.
- D. All alarm indicating appliances are installed and operational.
- E. All signaling line circuits are in service and operational.
- F. The control panel is cleared of any faults, alarms, supervisory signals, and trouble conditions.
- G. All supervisory initiation devices are installed and operational.

2.0 APPLICABILITY

At all times.

3.0 OPERATIONAL REQUIREMENTS

- A. The system is energized with primary and backup power.
- B. The manual fire alarm stations are operational and located in all required locations.
- C. The audible and/or visual alarming indicating appliances are installed and located in all required locations.
- D. All fire sprinkler waterflow alarms are connected and operational.
- E. All fire detector alarms are connected and operational.
- F. All other alarm initiation devices are connected and operational.
- G. All supervisory devices (such as valve tamper, low air pressure, fire pump supervisory devices, low water, and low temperature switches) are connected, in their normal position, and operational.
- H. All trouble conditions are clear.
- I. All external circuits are electrically supervised.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the fire alarm control panel (FACP) indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 24 hours or B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the fire detection devices to verify that a fire can be detected.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 72
- D. NFPA 72E

8.0 BASIS

The operability of the fire alarm system ensures that the condition causing the alarm is reported to occupants and any required central monitoring service. It also ensures that the life safety notification provisions of the facility are maintained during all anticipated operations.

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1.0 COMMITMENT

The Central Monitoring System is operable when the following are established.

- A. AC power is supplied to the system.
- B. DC power is supplied to the system.
- C. All remote fire alarm systems are installed and operational.
- D. All alarm indicating appliances are installed and operational.
- E. All signaling line circuits are in service and operational.
- F. The control panel is cleared of any faults, alarms, supervisory signals, and trouble conditions.
- G. All supervisory indicating appliances are installed and operational.
- H. All system printers are installed and operational.
- I. All offsite alarm circuits are installed and operational.

2.0 APPLICABILITY

At all times.

3.0 OPERATIONAL REQUIREMENTS

- A. The system is energized with primary and backup power.
- B. The remote fire alarm systems are operational and located in all required locations.
- C. The audible and/or visual alarming-indicating appliances are installed and located in all required locations.
- D. All system printers are installed and operational.
- E. All trouble conditions are clear.
- F. All external circuits are electrically supervised.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 71, NFPA 72, and NFPA 72E.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 24 hours or B or C or D shall be required until the repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Test the fire alarm subsystem devices to verify that an alarm or supervisory signal can be received and recorded.

6.0 RECORDS

Maintain records for the life of the facility showing the system design and all inspection and testing.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 71
- D. NFPA 72
- E. NFPA 72E

8.0 BASIS

The operability of the central monitoring system ensures that the condition causing the alarm is reported to occupants and any required offsite service. It also ensures that the life safety notification provisions of the facility are maintained during all anticipated operations.

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61 - FIRE DOORS AND WINDOWS

1.0 COMMITMENT

- A. Fire doors or windows are installed in all required openings.
- B. Each fire door and window is equipped with listed or approved hardware (hinges, latching device, holder and closer, smoke gasketing) as required.
- C. Fire doors and windows are operable at all times.
- D. Fire doors and windows are closed unless arranged for automatic closing and release.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. All fire doors, windows, and related hardware are in the required locations and in good physical condition.
- B. Opening and closing hardware is operable.
- C. Doors and windows are either closed or equipped with operable automatic-releasing devices.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection Inspection, Testing, and Maintenance Procedures (Appendix B) and NFPA 80.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. If one or more of the commitments is not maintained, post a sign at the fire door or window indicating that door and opening protection

are not in service. The AHJ shall specify the size and location of the sign.

- B. Stop all hazardous operations, and/or
- C. Provide an alternate means protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ will decide if B and/or C will be required until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct a full operation test after completing any repairs.

6.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 80

8.0 BASES

Operable fire door and window systems provide an effective fire barrier at the system-rated duration for the life of the facility.

62 - FIRE DAMPERS

1.0 COMMITMENT

- A. Fire dampers are installed in all required openings.
- B. Each fire damper is equipped with listed or approved hardware (fusible link, magnetic closer, smoke gasketing) as required.
- C. Fire dampers are operable at all times.
- D. Fire dampers are kept closed unless arranged for automatic closing and release.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. All fire dampers are in the required locations and in good physical condition.
- B. Opening and closing hardware is operable.
- C. Dampers are either closed or equipped with operable automatic releasing devices.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) and NFPA 90A.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. If one or more of the commitments is not maintained, post a sign at the fire damper indicating that duct protection is not in service. The AHJ will specify the size and location of the sign.

- B. All hazardous operations will stop, and/or
- C. An alternate means will be provided to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. Conduct a full operation test after completing any repairs.

6.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 90A

8.0 BASIS

Operable fire damper systems provide an effective fire barrier at the system-rated duration for the life of the facility.

63 - PENETRATIONS IN FIRE WALLS

1.0 COMMITMENT

- A. Approved fire resistance rated material is installed in all required penetrations of fire walls and barriers.
- B. The fire resistant material is installed in accordance with its listing and/or approval.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

All required penetrations are filled with properly rated material in accordance with its listing and/or approval.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B) and NFPA 220.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. If one or more of the commitments is not maintained, post a sign at the penetration indicating that penetration protection is not in service. The AHJ will specify the size and location of the sign.
- B. All hazardous operations will be stopped, and/or
- C. An alternate means will be provided to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

5.2 Inspection

- A. Visually inspect the system before returning to service.

5.3 Testing

- A. None required.

6.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A

8.0 BASIS

Operable penetration protection ensures an effective fire barrier for the system-rated duration for the life of the facility.

71 - EMERGENCY AND EXIT ILLUMINATION

1.0 COMMITMENT

- A. Exit lights with battery or generator backup power are installed in all required locations.
- B. Exit access illumination lights with battery or generator backup power are installed in all required locations.
- C. The exit and exit access illumination lights are installed, powered, and in good repair.

2.0 APPLICABILITY

At all times.

3.0 OPERABILITY REQUIREMENTS

- A. The light fixtures are installed, powered, and operable.
- B. There is power available to charge the batteries.
- C. The batteries are charged to at least 90% of the required electrical charge.

4.0 MAINTENANCE, TESTING, AND INSPECTION

- A. Inspect, test, and maintain the system in accordance with the DOE Fire Protection, Inspection, Testing, and Maintenance Procedures (Appendix B), NFPA 101, NFPA 110, and NFPA 110A.
- B. Reduced frequency of testing is allowed if the facility can prove increased reliability by submitting testing records and a proposed schedule to the AHJ for review and acceptance.

5.0 CORRECTIVE ACTION

5.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. If one or more of the commitments is not maintained, evacuate all occupants.
- B. Begin repair operations within 24 hours. The AHJ shall decide if A is necessary.

5.2 Inspection

- A. Visually inspect each fixture before returning to service.

5.3 Testing

- A. Operation test each fixture when a unit is returned to service.

6.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

7.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 101
- D. NFPA 110
- E. NFPA 110A

8.0 BASIS

Exit signs and exit access illumination must be operable and adequate in accordance with the life safety provisions of the facility.